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THE RESULTS OF THE LES-5 AND LES-6 RFI EXPERIMENTS

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## ABSTRACT

This report, a supplement to Lincoln Laboratory Technical Note 1970-3, presents the results of further computer processing by the Aerospace Corporation of LES-6 RFI data taken during the period November 1968 - October 1969.

Accepted for the Air Force  
Franklin C. Hudson  
Chief, Lincoln Laboratory Office



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Section VII, "Regional Characteristics of LES-5 RFI Observations," in the basic report\* contains the results of computer processing by the Aerospace Corporation of the LES-5 RFI data. In that procedure, the data were sorted by sub-satellite longitude and merged into data groups. The results were presented as Figures 33 through 37.

A similar process has now been completed for the LES-6 RFI data taken during the period November 1968 - October 1969. Throughout most of that time, (until late July of 1969), LES-6 was station-kept near  $90^{\circ}$  west longitude. In late July 1969 LES-6 was put into a station-changing mode and began moving toward a new station near  $38^{\circ}$  west longitude, where it arrived in December 1969. By October 1969, LES-6 had moved to about  $60^{\circ}$  west longitude, with coverage extending well into Europe. This seemed too small a geographical separation from the original station to make it worthwhile to sort the data by sub-satellite longitudes, however. Instead, the LES-6 RFI data have been grouped by time of day.

Group A	1200 to 0400 GMT	{ 0600 to 2200 Central Standard Time 0700 to 2300 Central Daylight Time
Group B	0400 to 1200 GMT	{ 2200 to 0600 Central Standard Time 2300 to 0700 Central Daylight Time

Group A corresponds approximately to the "busy" working-day and early-evening hours in North and South America, the principal land areas seen by LES-6 from its initial orbital station (see Figure 3). Group B corresponds approximately to the "quiet" late-evening and early-morning hours remaining in the 24-hour day. The

\*W. W. Ward, et al., "The Results of the LES-5 and LES-6 RFI Experiments," Technical Note 1970-3, Lincoln Laboratory, M.I.T. (6 February 1970), DDC - AD-703738. It is assumed that the reader of this report has a copy of the earlier one for reference. The figures in this report are numbered in sequence following those in the earlier one.

adjectives "busy" and "quiet" refer to the activities of most people living in the areas concerned; it is of interest in the LES-6 RFI experiment to see to what extent there are similar characteristics for the merged Group A and Group B data. The existence of four time zones in the continental U. S. makes the demarcations between "busy" and "quiet" periods for LES-6 RFI data somewhat fuzzy. The data could be sorted on a finer-grained basis (for example, into 12 two-hour-long intervals), but it would then be advisable to enlarge the data base.

Figures 38 through 41 present the results of this further computer processing. Note that data from the LES-6 peak-to-average-power-ratio channel are presented, for the calibration of that channel is more reliable than was the case for the corresponding LES-5 channel. The number of RFI scans in each Group (318 and 164) is in proportionate agreement with the corresponding number of hours (16 and 8 respectively). There is an average yield of 2 11-minute-long scans per hour because of the timing sequence of the RFI instrument (see Figure 5). The merged LES-6 data come from about 14 24-hour-long data-taking runs. Much more data telemetered from LES-6 was recorded for other purposes; only this portion of it was processed for the LES-6 RFI experiment.

As of this writing, LES-6 continues to function normally in orbit at its new station. Telemetered data are collected on an austere schedule. There has been no further processing of RFI data, however.

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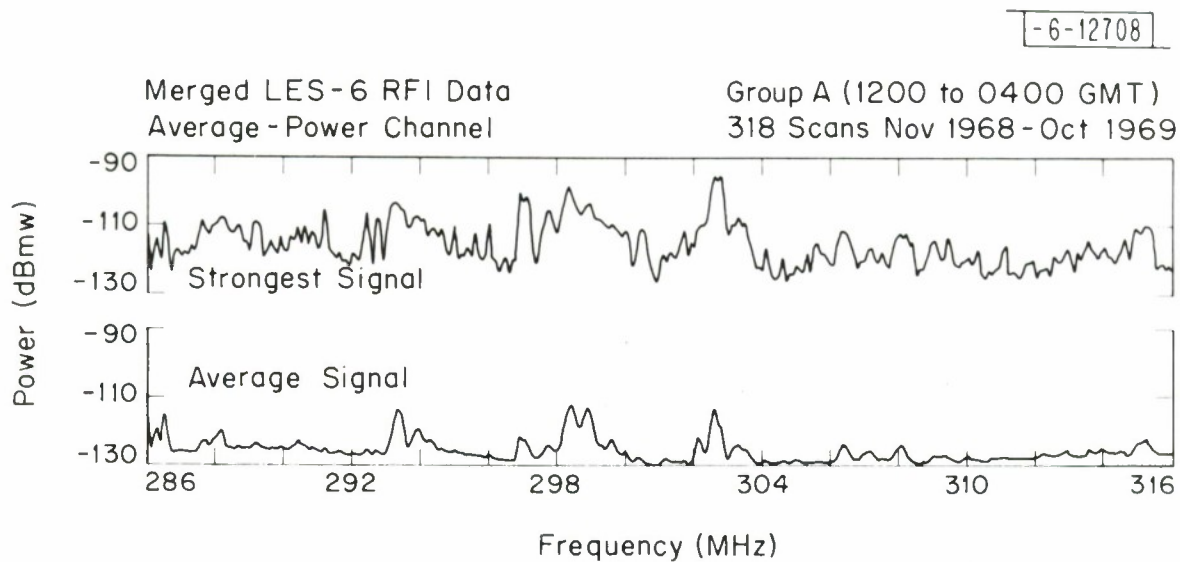


Fig. 38.

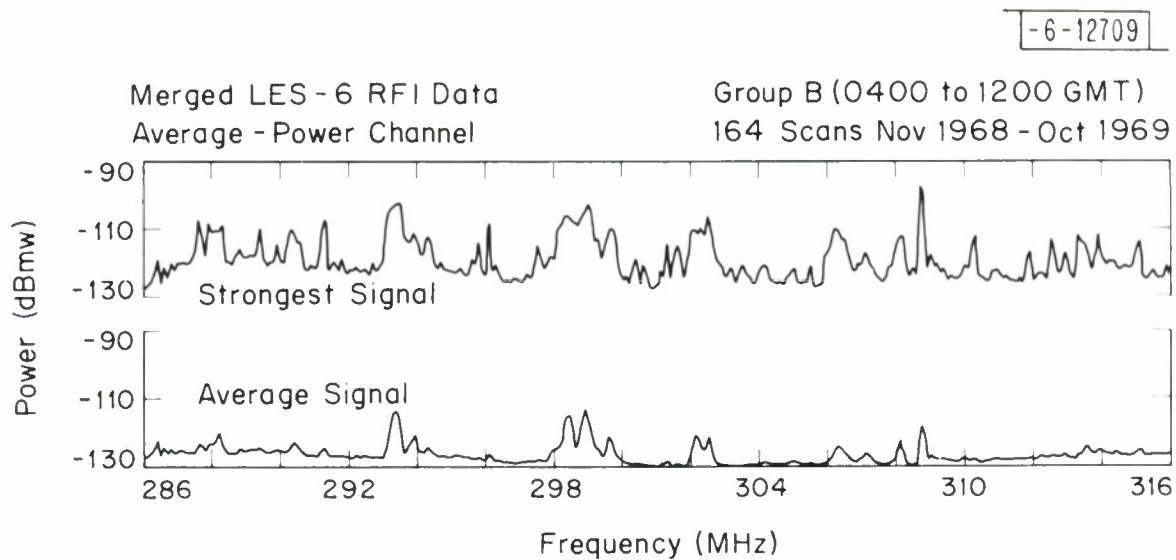


Fig. 39.

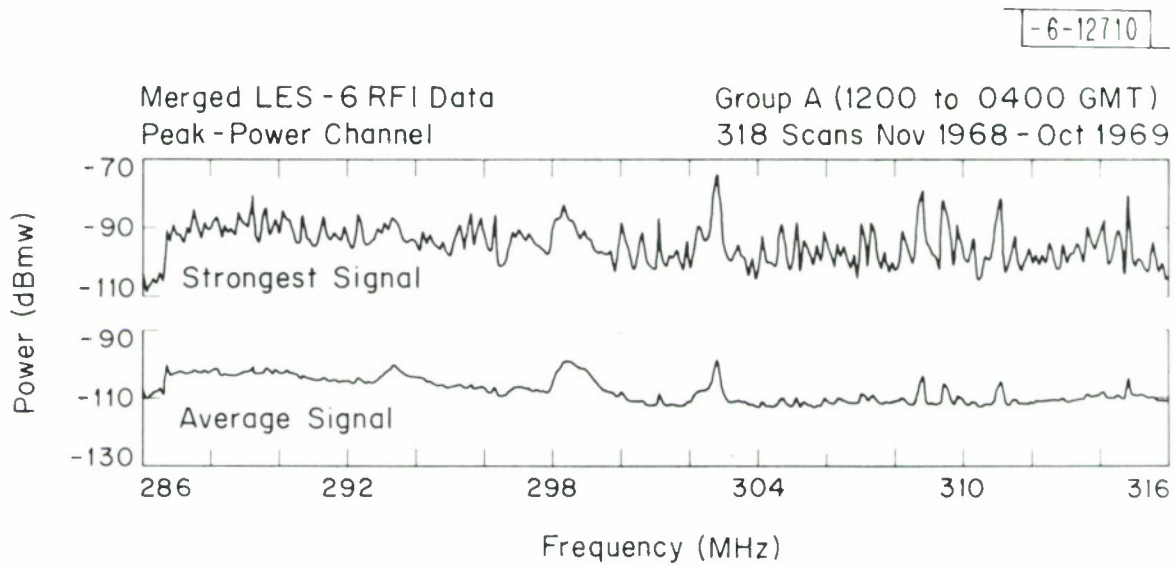


Fig. 40.

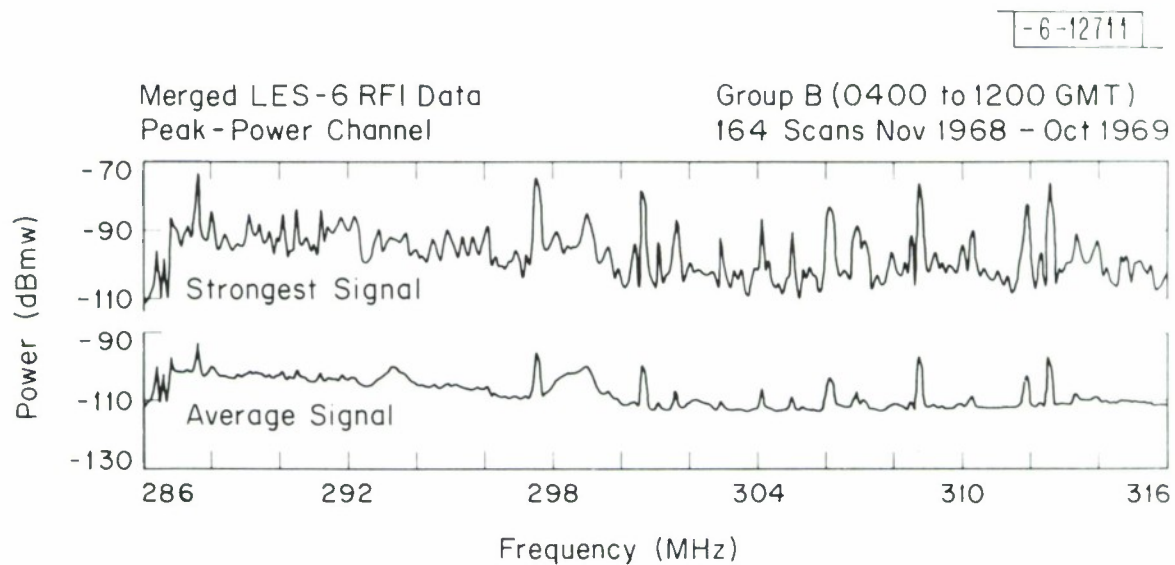


Fig. 41.

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14. KEY WORDS		
LES-5 LES-6 Lincoln Experimental Satellite Radio-frequency interference (RFI)	RFI experiment RFI instrument RFI survey Electromagnetic environment	Communications satellite Military UHF band Telemetry systems